

CLAIMS

What is claimed is:

1. A method of maintaining a substrate support at a set point temperature in a reaction chamber upon a rise in temperature of the chamber, comprising the steps of:

circulating a main coolant fluid having the set point temperature through the substrate support; and

circulating a compensation coolant fluid having a cooling temperature lower than said set point temperature through the substrate support upon the rise in temperature of the chamber.

2. The method of claim 1 wherein said set point temperature is about 60 °C.

3. The method of claim 1 wherein said cooling temperature is about 50 °C.

4. The method of claim 3 wherein said set point temperature is about 60 °C.

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5. The method of claim 1 wherein said main coolant fluid and said compensation coolant fluid each comprises water.

6. The method of claim 5 wherein said set point temperature is about 60 °C.

7. The method of claim 5 wherein said coolant temperature is about 50 °C.

8. The method of claim 7 wherein said set point temperature is about 60 °C.

9. A method of maintaining a substrate support confluently connected to a main coolant chamber containing main coolant at a set point temperature, comprising the steps of:

circulating the main coolant through the substrate support at the set point temperature;

providing a compensation coolant chamber containing compensation coolant in fluid communication with said substrate support; and

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circulating the compensation coolant from said compensation coolant chamber through the substrate support at a cooling temperature lower than said set point temperature upon a rise in temperature of the substrate support above the set point temperature.

10. The method of claim 9 wherein said set point temperature is about 60 °C.

11. The method of claim 9 wherein said coolant temperature is about 50 °C.

12. The method of claim 11 wherein said set point temperature is about 60 °C.

13. The method of claim 9 further comprising the steps of providing a P/N junction module in thermal contact with the substrate support for sensing a temperature of the substrate support and controlling flow of the compensation coolant through the substrate support by operation of said P/N junction.

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14. The method of claim 13 wherein said set point temperature is about 60 °C and said coolant temperature is about 50 °C.

15. The method of claim 9 further comprising the step of providing a compensation circulation loop between said compensation coolant chamber and the substrate support, and wherein said circulating said compensation coolant from said compensation coolant chamber through the substrate support comprises circulating said compensation coolant through said compensation coolant delivery line and said compensation circulation loop.

16. The method of claim 15 wherein said set point temperature is about 60 °C and said coolant temperature is about 50 °C.

17. A method of maintaining a substrate support at a set point temperature in a reaction chamber upon a rise in temperature of the chamber, said reaction chamber connected to a main coolant chamber containing a main coolant and a compensation coolant chamber containing a compensation coolant, comprising the steps of:

obtaining a set point temperature line;

obtaining a main temperature characteristic curve on a first side of said set point temperature line by operating the reaction chamber and the main coolant chamber;

obtaining a temperature compensation characteristic curve on a second side of said set point temperature line by providing a mirror reflection of said main temperature characteristic curve on a second side of said set point temperature line; and

maintaining the substrate support at the set point temperature by operating said compensation coolant chamber in accordance with said temperature compensation characteristic curve.

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18. The method of claim 17 wherein said set point temperature line corresponds to a set point temperature of about 60 °C.

19. The method of claim 17 further comprising the steps of providing a P/N junction module in thermal contact with the substrate support for sensing a temperature of the substrate support and wherein said operating said compensation coolant chamber comprises controlling flow of the compensation coolant through the substrate support by operation of said P/N junction.

20. The method of claim 19 wherein said set point temperature line corresponds to a set point temperature of about 60 °C.